What is claimed is

1. An alloy composition comprising:

titanium; and

a molybdenum equivalent weight of about 7 to about 11 wt%, wherein the weight percents are based upon the total weight of the alloy composition, wherein the alloy composition is superelastic and/or pseudoelastic.

2. The composition of Claim 1, wherein the composition is cold worked and/or solution treated; and wherein the solution treating can be conducted at a temperature above and/or below the β transus temperature.

3. The composition of Claim 1, wherein the molybdenum equivalent weight is determined by the equation (1)

$$Mo_{eq.} = 1.00Mo + 0.28Nb + 0.22Ta + 0.67V + 1.43Co + 1.60Cr + 0.77Cu + 2.90Fe + 1.54Mn + 1.11Ni + 0.44W - 1.00Al \quad (1)$$

or the equation (2)

$$Mo_{eq.} = 1.00Mo + 0.28Nb + 0.22Ta + 0.67V + 1.43Co + 1.60Cr + 0.77Cu + 2.90Fe + 1.54Mn + 1.11Ni + 0.44W + 0.25(Sn + Zr + Hf) - 1.00Al \quad (2)$$

wherein Mo is molybdenum, Nb is niobium, Ta is tantalum, V is vanadium, Co is cobalt, Cr is chromium, Cu is copper, Fe is iron, Mn is manganese, Ni is nickel, W is tungsten, Al is aluminum, Sn is tin, Zr is zirconium and Hf is hafnium; wherein aluminum can be substituted by gallium, carbon, germanium and/or boron; and wherein the respective chemical symbols represent the amounts of the respective elements in weight percent based on the total weight of the alloy composition.

4. The composition of Claim 1, comprising:

about 8 to about 10 wt% molybdenum,

about 2.8 to about 6 wt% aluminum,

up to about 2 wt% vanadium,

up to about 4 wt% niobium, with the balance being titanium, wherein the weight percents are based on the total weight of the alloy composition, and wherein the composition is cold worked.

5. The composition of Claim 4, further comprising solution treating the composition at a temperature of greater than or equal to the β transus temperature for a time period of greater than or equal to about 30 seconds.

6. The composition of Claim 5, wherein the temperature is about 850 to about 1000°C.

7. The composition of Claim 4, further comprising solution treating the composition at a temperature of less than or equal to the β transus temperature for a time period of greater than or equal to about 1 minute.

8. The composition of Claim 7, wherein the temperature is about 750 to about 850°C.

9. The composition of Claim 1, wherein the composition has a β phase and/or an α and a β phase.

10. The composition of Claim 1, wherein the composition has an elastic recovery of greater than or equal to about 75% of the applied change in length when the applied change in length is 2% of the original length.

11. The composition of Claim 1, wherein the composition has an elastic recovery of greater than or equal to about 85% of the applied change in length when the applied change in length is 2% of the original length.

12. The composition of Claim 1, wherein the composition has an elastic recovery of greater than or equal to about 50% of the applied change in length when the applied change in length is 4% of the original length.

13. The composition of Claim 1, wherein the composition has an elastic recovery of greater than or equal to about 75% of the applied change in length when the applied change in length is 4% of the original length.

14. The composition of Claim 1, wherein the composition after cold working has a reduction in the elastic modulus of greater than or equal to about 10% when compared with the elastic modulus of an equivalent heat treated composition.

15. The composition of Claim 1, wherein the composition after cold working has a reduction in the elastic modulus of greater than or equal to about 20% when compared with the elastic modulus of an equivalent heat treated composition.

16. The composition of Claim 1, wherein the composition after cold working has a reduction in the elastic modulus of greater than or equal to about 25% when compared with the elastic modulus of an equivalent heat treated composition.

17. The composition of Claim 4, wherein the composition, after cold working and/or solution treating, has an elastic recovery of greater than or equal to about 75% of the applied change in length when the applied change in length is 2% of the original length.

18. The composition of Claim 4, wherein the composition, after cold working and/or solution treating, has an elastic recovery of greater than or equal to about 85% of the applied change in length when the applied change in length is 2% of the original length.

19. The composition of Claim 4, wherein the composition, after cold working and/or solution treating, has an elastic recovery of greater than or equal to about 50% of the applied change in length when the applied change in length is 4% of the original length.

20. The composition of Claim 4, wherein the composition, after cold working and/or solution treating, has an elastic recovery of greater than or equal to about 75% of the applied change in length when the applied change in length is 4% of the original length.

21. The composition of Claim 4, wherein the composition, after cold working, has a reduction in the elastic modulus of greater than or equal to about 10% when compared with the elastic modulus of an equivalent heat treated composition.

22. The composition of Claim 4, wherein the composition, after cold working, has a reduction in the elastic modulus of greater than or equal to about 20% when compared with the elastic modulus of an equivalent heat treated composition.

23. The composition of Claim 4, wherein the composition, after cold working, has a reduction in the elastic modulus of greater than or equal to about 25% when compared with the elastic modulus of an equivalent heat treated composition.

24. An article manufactured from the composition of Claim 1.

25. An article manufactured from the composition of Claim 4.

26. A method for making an article comprising:

working a shape, wherein the shape has a composition comprising titanium; and a molybdenum equivalent weight of about 7 to about 11 wt%, wherein the weight percents are based upon the total weight of the alloy composition; and wherein the molybdenum equivalent weights are determined by the equation (1)

$$Mo_{eq.} = 1.00Mo + 0.28Nb + 0.22Ta + 0.67V + 1.43Co + 1.60Cr + 0.77Cu + 2.90Fe + 1.54Mn + 1.11Ni + 0.44W - 1.00Al \quad (1)$$

or the equation (2)

$$Mo_{eq.} = 1.00Mo + 0.28Nb + 0.22Ta + 0.67V + 1.43Co + 1.60Cr + 0.77Cu + 2.90Fe + 1.54Mn + 1.11Ni + 0.44W + 0.25(Sn + Zr + Hf) - 1.00Al \quad (2)$$

wherein Mo is molybdenum, Nb is niobium, Ta is tantalum, V is vanadium, Co is cobalt, Cr is chromium, Cu is copper, Fe is iron, Mn is manganese, Ni is nickel, W is tungsten, Al is aluminum, Sn is tin, Zr is zirconium and Hf is hafnium; wherein the aluminum can be substituted by boron, carbon, gallium and/or germanium and wherein the respective chemical symbols represent the amounts of the respective elements in weight percent based on the total weight of the alloy composition;

solution treating the shape; and

cooling the shape.

27. The method of Claim 26, wherein the working is accomplished through cold working or hot working.

28. The method of Claim 26, wherein the solution treating is conducted at a temperature below the β transus temperature for the composition.

29. The method of Claim 26, wherein the solution treating is conducted at a temperature above the β transus temperature for the composition.

30. The method of Claim 26, wherein the cooling is conducted in air and/or an inert gas.

31. The method of Claim 26, wherein the shape is further heat aged at a temperature of about 350 to about 550°C.

32. The method of Claim 31, wherein the heat ageing is conducted for a time period of 10 seconds to about 8 hours.

33. The method of Claim 26, further comprising cold working the shape.

34. A method for making an article comprising:

cold working a shape from a composition comprising about 8 to about 10 wt% molybdenum, about 2.8 to about 6 wt% aluminum, up to about 2 wt% vanadium, up to about 4 wt% niobium, with the balance being titanium, wherein the weight percents are based on the total weight of the alloy composition;

solution treating the shape; and

cooling the shape.

35. The method of Claim 34, wherein the solution treating is conducted at a temperature below the isomorphic temperature for the composition.

36. The method of Claim 34, wherein the solution treating is conducted at a temperature above the isomorphic temperature for the composition.

37. The method of Claim 34, wherein the cooling is conducted in air.

38. The method of Claim 34, wherein the shape is further heat aged at a temperature of about 350 to about 550°C.

39. The method of Claim 38, wherein the heat ageing is conducted for a time period of 10 seconds to about 8 hours.

40. The method of Claim 34, further comprising cold working the shape.

41. A method comprising:

cold working a wire having a composition comprising titanium; and a molybdenum equivalent weight of about 7 to about 11 wt%, wherein the weight percents are based upon the total weight of the alloy composition; and wherein the molybdenum equivalent weights are determined by the equation (1)

$$Mo_{eq.} = 1.00Mo + 0.28Nb + 0.22Ta + 0.67V + 1.43Co + 1.60Cr + 0.77Cu + 2.90Fe + 1.54Mn + 1.11Ni + 0.44W - 1.00Al \quad (1)$$

or the equation (2)

$$Mo_{eq.} = 1.00Mo + 0.28Nb + 0.22Ta + 0.67V + 1.43Co + 1.60Cr + 0.77Cu + 2.90Fe + 1.54Mn + 1.11Ni + 0.44W + 0.25(Sn + Zr + Hf) - 1.00Al \quad (2)$$

wherein Mo is molybdenum, Nb is niobium, Ta is tantalum, V is vanadium, Co is cobalt, Cr is chromium, Cu is copper, Fe is iron, Mn is manganese, Ni is nickel, W is tungsten, Al is aluminum, S is tin, Zr is zirconium and Hf is hafnium; and wherein the respective chemical symbols represent the amounts of the respective elements in weight percent based on the total weight of the alloy composition;

solution treating the wire; and

heat treating the wire.

42. The method of Claim 41, wherein the composition comprises about 8 to about 10 wt% molybdenum, about 2.8 to about 6 wt% aluminum, up to about 2 wt% vanadium, up to about 4 wt% niobium, with the balance being titanium, wherein the weight percents are based on the total weight of the alloy composition.

43. The method of Claim 41, wherein the cold working results in a reduction in cross-sectional area of about 5 to about 85%.

44. The method of Claim 41, wherein the wire diameter is about 0.1 to about 10 millimeters.

45. The method of Claim 41, wherein the heat treating is conducted at a temperature of about 500°C to about 900°C.

46. The method of Claim 41, wherein the wire is solution treated at a temperature of about 800 to about 1000°C.

47. The method of Claim 41, wherein the article has a β phase or an α phase and a β phase.

48. The method of Claim 41, wherein the article has an elastic recovery of greater than or equal to about 75% of the applied change in length when the applied change in length is 2% of the original length.

49. The method of Claim 41, wherein the article has an elastic recovery of greater than or equal to about 50% of the applied change in length when the applied change in length is 4% of the original length.